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Multi-range high-frequency EPR spectroscopy of LiYF4 and LiLuF4 crystals doped by rare-earth ions

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Abstract

EPR spectra of isostructural LiYF4 and LiLuF4 crystals doped by Dy3+, Er3+, and Ho3+ ions are measured at 4.2 K in the frequency range 40-800 GHz. The effects caused by isotopic disorder in the lithium sublattice, the random crystal field, and the interaction between paramagnetic impurity ions are detected and studied. The results of the measurements are used to determine the spectral characteristics of the compounds and the crystal field parameters. It is demonstrated that the formation of the isotope structure of the EPR signal is dominated by local deformations of the crystal lattice induced by mass defects. © 2008 Pleiades Publishing, Ltd.

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